



U.S. Department of Justice

Office of Justice Programs

*Innovation * Partnerships * Safer Neighborhoods*

NamUs *National Missing and Unidentified Persons System*



National Missing and Unidentified Persons System

(NamUs)

Concept of Operations

Version 1.1

(January 2011)



Background

The National Missing and Unidentified Persons System (NamUs) is a clearinghouse for missing persons and unidentified decedent records. The NamUs system, located online at www.namus.gov, is a free Web-based system that can be searched by medical examiners, coroners, law enforcement personnel and the general public to help solve missing and unidentified persons cases.

The Unidentified Persons (UP) Database contains case information that has been entered by medical examiners and coroners, and in some states, law enforcement personnel. Anyone can search the UP database using characteristics such as sex, race, distinct body features and even dental information.

The Missing Persons (MP) Database contains information on missing persons. This information can be entered by anyone; however, before a case appears on NamUs MP, the information must be verified by a NamUs Regional System Specialist (RSS). NamUs MP provides the ability to print missing persons posters and even map out possible travel routes in a search for a missing person. Other resources provided by the MP database include links to state clearinghouses, medical examiner and coroner offices, law enforcement agencies, victim assistance groups and pertinent legislation.

When a new missing or unidentified persons case is entered into NamUs and validated, the system automatically performs cross-matching comparisons between the databases, searching for matches or similarities between cases. Registered NamUs users including law enforcement personnel, medical examiners, coroners, and case managers are able to view system-generated matches and adjust matching criteria to filter results.

NamUs also provides access to free DNA testing and other forensic services such as anthropology and odontology assistance.

Concept of Operations Overview

This NamUs Concept of Operations (ConOps) document intends to define the current roles of all NamUs stakeholders, communicate system characteristics, and provide descriptions of how NamUs capabilities may be employed to achieve the objectives of the system. This ConOps also provides a clear methodology for meeting the goals of the NamUs program.

This document provides direction regarding the following crucial topics:

- Strategies, policies and constraints affecting the system
- Clear statement of responsibilities and delegation of authorities
- Specific processes for operating the system

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1 Organizational Structure –

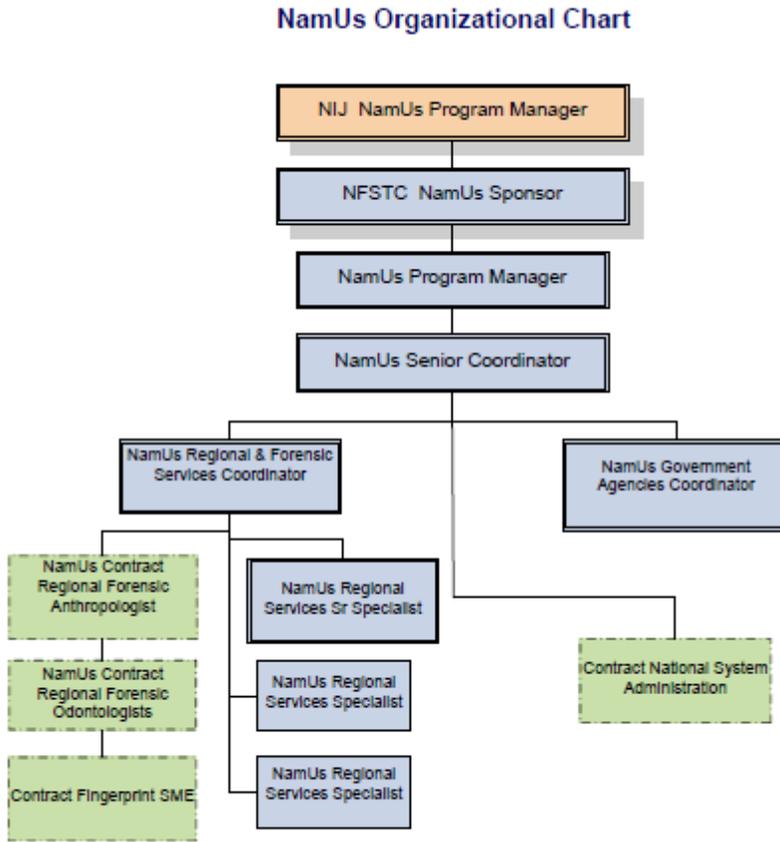


Figure 1. NamUs organizational structure

2 Program Funding, Management and Staff

NamUs is funded by a cooperative agreement with the National Institute of Justice (NIJ) and is operated by the National Forensic Science Technology Center (NFSTC). NFSTC is a 501(c)(3) not-for-profit corporation headquartered in Largo, FL.

The NamUs program management staff performs the overall coordination of NamUs activities, ensuring that operations run smoothly for all NamUs stakeholders. The NamUs organization is structured so that all roles report and communicate to the program management staff, thus providing a cohesive operation for both NFSTC and NIJ. Additionally, the structure serves to reliably implement new activities within other areas of the program with the goal of providing valuable services to the user community. The NamUs program management team includes:

- Program Sponsor (NFSTC Executive Team member)
- NamUs Operations Manager
- NamUs Senior Coordinator
- NamUs Government Agencies Coordinator
- NamUs Regional Forensic Services Coordinator
- NamUs Senior Regional Services Specialist
- NamUs Regional Services Specialist

2.1 National Forensic Science Technology Center (NFSTC)

NFSTC operates the day-to-day tasks for NamUs. As such, NFSTC provides leadership, guidance and support to all NamUs stakeholders and serves as the primary point of contact with NIJ. This includes assembling and arranging advisory group meetings, acquiring technology providers and directing any and all activities related to the success of the NamUs program.

Activities	Program leadership and management
	Communication with NIJ
Primary interactions	NIJ; website/tools development and technology management group; user community; advisory groups; partner organizations; media and communications group
Secondary interactions	Conferences, outreach activities and training sessions

2.2 National Institute of Justice (NIJ)

An NIJ Program Manager or Acting Program Manager from the Office of Investigative and Forensic Sciences supports the NamUs program needs at the executive level. This individual provides the necessary interaction between NFSTC and NIJ leadership to ensure the success of the NamUs program.

NIJ leadership also provides the necessary interactions with federal agencies and offices that wish to become part of the stakeholder community. NIJ should take the lead in these relations.

Activities	Program leadership (funding, resources, issue resolution)
	Communication with NFSTC
	Other federal agency/office relations
Primary interactions	NFSTC; forensic DNA laboratories; FBI-CJIS; NCMEC; VICAP
Secondary interactions	Law enforcement agencies

2.3 Advisory Group

The NamUs Working Group serves as an advisory group to NIJ on issues related to how NamUs addresses the following:

- Operational guidelines for activities relating to NamUs Missing Persons (MP) and Unidentified Persons (UP) databases and related resources
- Support national policies for NamUs and Missing Persons and Unidentified Persons database resources
- Support development of awareness and outreach tools for NamUs
- Support NamUs training for law enforcement, medical examiners, coroners and Missing Persons clearinghouse directors and staff

Activities	Provide subject matter expertise
	Build topical consensus
	Provide direction
	Support NamUs training efforts
Primary interactions	NFSTC; NIJ
Secondary interactions	RSSs and FS; other stakeholder agencies

2.4 Regional Services Specialist (RSS)

To support user registration processes and ensure the integrity of NamUs case data, the NamUs System is supported by a team of Regional Services Specialists. Each RSS is assigned to a specific geographic area of the country and acts as a liaison between NamUs and state and local agencies including law enforcement, missing persons clearinghouses, medical examiners and coroners, and families of the missing.

2.4.1 Regional Assignments

RSSs perform a variety of tasks for their assigned geographic region including user registration validation and training; case information management; forensic services support; outreach and advocacy activities.

2.4.2 User Registration and Secure User Validation

Registered and non-registered public users do not require RSS validation. Requests for permission levels above registered public user require validation by an RSS. RSSs play an active role in user registration by vetting law enforcement, forensic specialists and clearinghouse staff prior to activating their user registration and granting the appropriate access level. Once activated, secure users have access to sensitive case data and case matching capabilities depending on their level of approved, authorized view and edit capabilities.

(To view a chart illustrating the process for registering and verifying non-public users, see Appendix A.)

2.4.3 Public NamUs Missing Persons Case Entry and Validation Process

RSSs support public case entry and case validation to ensure that publically entered cases meet minimum information requirements, and that each public NamUs MP case is confirmed with law

enforcement (LE) by validating the LE and National Crime Information Center (NCIC) case numbers. Case entry and validation follows the following process:

1. Registered public user initiates a new case
2. User enters required information
3. User submits case to the case manager
4. Case populates in RSS queue
5. RSS validates case
6. RSS publishes case to system

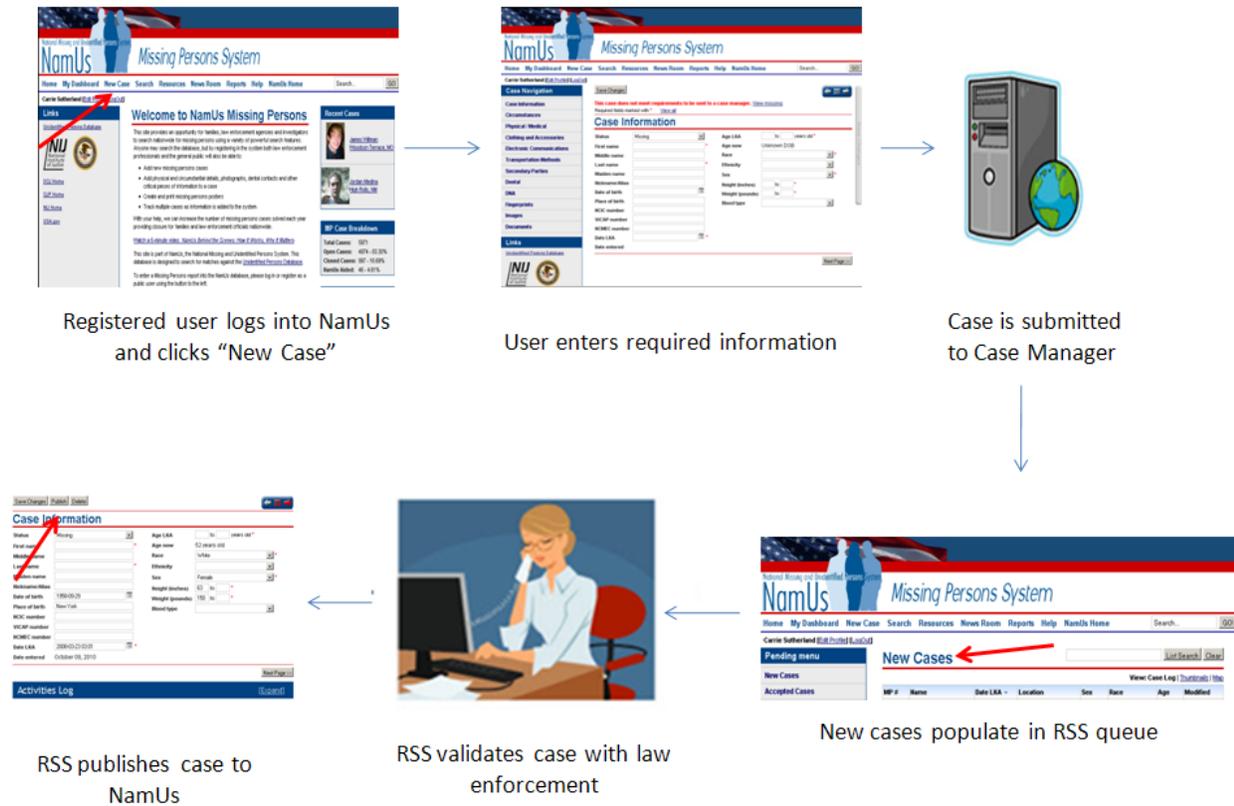


Figure 2. Case submission and validation

2.4.4 Forensic Services Facilitation

RSSs facilitate forensic identification processes by working with the Regional and Forensic Services Coordinator and individual anthropologists, odontologists, and other subject matter experts. They work together to enrich case data and help families obtain information that may be missing from their cases. RSSs also coordinate efforts of the forensic services team to verify case information provided for NamUs UP potential matches and exclusions.

2.4.5 Outreach and Advocacy Activities

RSSs work proactively to raise awareness of NamUs in the justice and medical examiner/coroner communities. Outreach efforts include supporting agency-requested NCIC data exchanges. In addition, RSSs serve as a liaison between the NFTSC communications team and the media for their assigned territory and provide media relations support via presentation of approved NamUs materials.

2.4.6 Partnerships and Specialized RSSs

In addition to the NamUs RSSs described above, NamUs has developed partnerships with federal agencies and non-profit organizations to support data entry and quality assurance while maintaining the security and integrity of other external data sources.

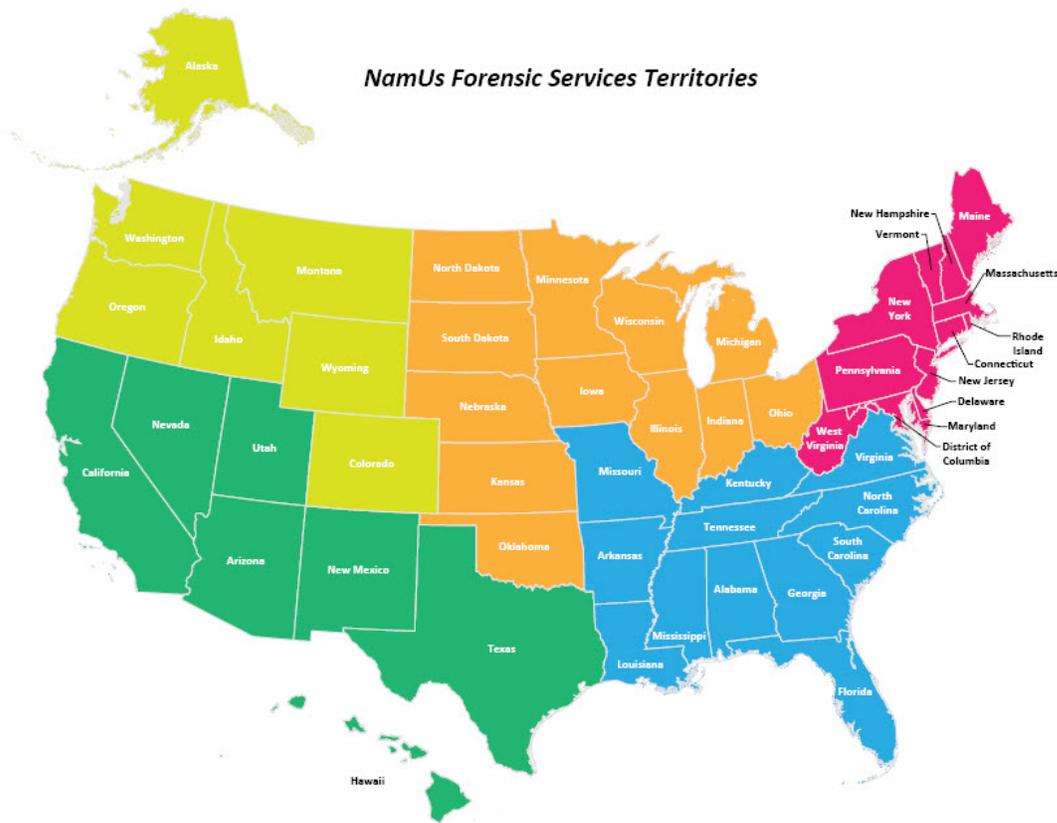
The partnership formed with the FBI's Violent Criminal Apprehension Program (ViCAP) Unit and the NCIC provides external personnel to serve as Government Agencies Coordinators. These coordinators perform case validation by coordinating case entry and data exchanges from ViCap and NCIC databases.

The National Center for Missing and Exploited Children (NCMEC) also provides external personnel as specialized RSSs performing case entry, validation and management of NCMEC's NamUs cases.

The working relationship with University of North Texas Center for Human Identification (UNTCHI) and NamUs enhances the resources and exchange of information related to missing and unidentified persons. UNTCHI provides free DNA analysis on unidentified remains and family reference samples, and qualifying results are entered into the FBI's Combined DNA Index System (CODIS) for national searches in the National Missing Persons DNA Database. Additionally, UNTCHI personnel update NamUs case information for DNA status as resources permit.

The advantages for partnering agencies include secure online case management capabilities, customized user levels, enhanced data elements, automated case exchanges, case viewing privileges and secure case manager functions that may be required for sensitive data.

2.5 NamUs Forensic Services



Forensic Services (FS) provides subject matter experts (SME) who support both sides of the NamUs System—the NamUs Missing Persons database and the Unidentified Persons database. SMEs ensure the accuracy of the forensic identification data entered into each database. The subject matter experts that make up the FS team are experts in the fields of fingerprint identification, forensic odontology and forensic anthropology. SMEs are selected based upon credentials, education and training. For expertise in DNA analysis, the FS has developed a close working relationship with UNTCHI.

2.5.1 NamUs Forensic Services (FS)

The FS team uses widely accepted best practices for uniquely recognizing or identifying humans based upon one or more intrinsic physical traits. These physical traits are correlated to DNA, fingerprints, dental and skeletal remains. The FS team provides or facilitates the following forensic services:

- **Fingerprint Identification** – Fingerprint identification (sometimes referred to as dactyloscopy) or palm print identification is the process of comparing questioned and known friction skin ridge impressions from fingers or palms, or even toes, to determine if the impressions are from the same finger or palm. The fingerprint expert will check the

accuracy of records entered into the MP database. When necessary, the fingerprint expert assists or verifies exclusions between the MP and UP databases.

- **Forensic Anthropology (FA)** – Forensic anthropological techniques can be used to assist in the recovery of remains; assess age, sex, stature, and/or ancestry; and analyze trauma and disease. Forensic anthropologists frequently work in conjunction with forensic pathologists, odontologists and homicide investigators to identify a decedent, discover evidence of trauma and determine the postmortem interval. Forensic anthropologists consult with law enforcement agencies on basic biological profile and preservation of human remains issues.
- **Forensic Odontology (FO)** – Forensic odontologists provide valuable assistance in obtaining, uploading and charting information on the dental page of the MP database. The FOs also apply scientifically and professionally established techniques such as x-rays, models, microscopy and photography to the identification of human remains and the medicolegal assessment of trauma to oral tissues. Teeth are highly resistant to destruction and decomposition, thus dental identification can be made under extreme circumstances.
- **DNA Analysis** – UNTCHI, in collaboration with law enforcement, offers families of missing loved ones the opportunity to submit reference samples for DNA testing. The UNTCHI laboratory is one of few facilities that integrates nuclear and mitochondrial DNA (mtDNA) for analyses. Forensic Services works with UNTCHI to provide free and efficient DNA testing of unidentified human remains and facilitate the collection of family reference samples for missing persons cases.

2.5.2 Forensic Services Operations

- **Forensic Services Organizational Structure** – FS supports the NamUs project through the FS team SMEs. The FS team is lead by the Regional and Forensic Services Coordinator, who works directly with the FS team in each forensic service area: fingerprints, forensic anthropology and forensic odontology. Regional forensic odontologists and forensic anthropologists have been assigned to support each region of the United States. Each Regional FS SME coordinates activities with the RSS assigned to that region. In addition, there are plans for forensic odontologist and forensic anthropologist volunteers to be identified and associated with specific states under the direction of a SME.
- **Activities** – FS works with NamUs RSSs to enrich case data and help obtain, verify and/or accurately upload critical forensic identification information. The FS SMEs also work in conjunction with criminal justice entities and medical examiners/coroners to enhance the UP database by acting as valuable resources for the examinations and activities associated with gathering and providing forensic data.
- **Requests for Forensic Services** – Forensic services are available to any criminal justice agency that requests them as appropriate. A request for a forensic service may come through various avenues including the RSS. RSSs work with the appropriate Regional FS SME and the Regional and Forensic Services Coordinator to determine the resources or work required to accomplish the request. The work may be conducted electronically or SME resources may be dispatched to a specific location.

- **Outreach and Advocacy Activities** – SMEs work proactively to raise awareness of NamUs in the justice and medical examiner/coroner communities. Outreach efforts include supporting criminal justice agencies and medical examiners/coroners. In addition, SMEs provide information to agencies and organizations within their assigned region through presentation of approved NamUs materials.

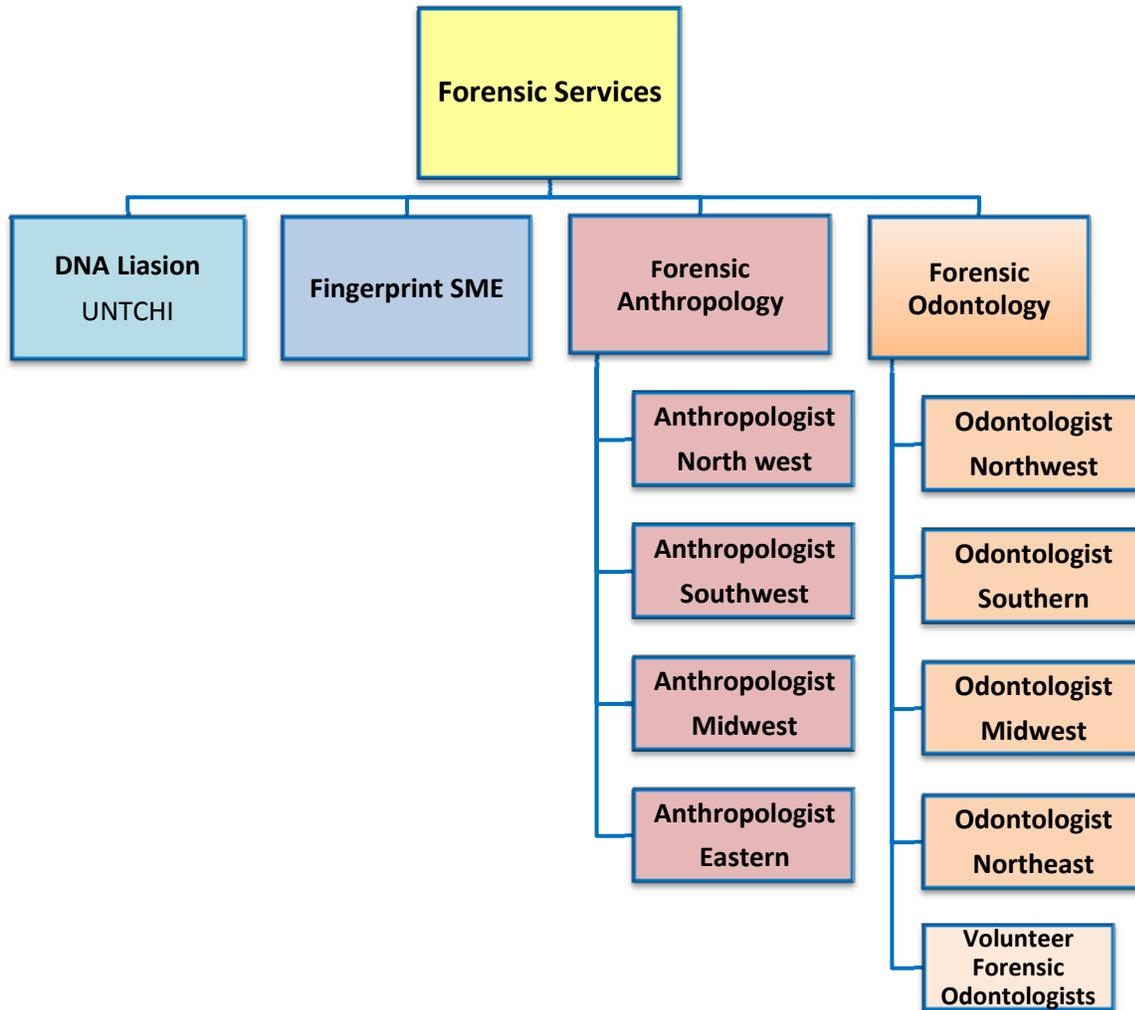


Figure 3. NamUs Forensic Services structure

2.6 Travel Policies

Travel for all NamUs-related meetings and conferences is at the discretion of the NamUs management team with approval from NIJ. NamUs Forensic Service team members, Regional

System Administrators and internal NFSTC staff may be asked to represent the NamUs program at various meetings and conferences throughout the country. These meetings and conferences include, but are not limited to, national, international, state and local organizations that deal with either missing persons or unidentified human remains, as well as federal, state and local agencies such as law enforcement, medical examiners and coroners, missing persons clearinghouses and victim advocates.

For all national and international meetings, a member of the NFSTC internal NamUs staff shall be present. For state, local and regional meetings, the program may be represented by a member of either the RSS or FS team. A formal travel document and request form is available to all NamUs team members. As appropriate, final approval for travel is granted by the Federal program manager.

3 Communications and Outreach

In order to operate smoothly, a program as intricate and fast-growing as NamUs requires ongoing and up-to-date communication methods. NFSTC has made provisions for communications within the NamUs team as well as external communications to reach out to target users and the general public.

3.1 Internal Communications

NFSTC has provided and maintains an online portal to store program documentation and make it available to other program personnel. This portal provides access to meeting notes, documents from working group meetings and program statistics and reports. Program personnel from around the country may securely log in to the portal at http://namus.nfstc.org/wp-login.php?redirect_to=%2F to retrieve timely documentation and notes.

In addition to the portal, the NamUs team at NFSTC provides timely updates to the RSS and FS team via email, regular conference calls and face-to-face meetings as required.

3.2 External Communications and Media Plan

Because NamUs is accessible to the general public via the Internet, external communications, website updating and media relations are critical. A product that is available to the general public needs to be responsive to inquiries from users and the media. For this reason, NFSTC has developed a simple media plan outline that identifies target audiences and key messages, and is intended for use in outreach activities or when responding to media inquiries.

NamUs is a unique program due to its accessibility by the general public and the compelling nature of missing and unidentified persons cases. Because of this, there is media interest in the topic from trade and general media outlets of all sizes, creating a substantial need for resources to handle the inquiries.

These inquiries offer a great opportunity to position NamUs appropriately in the minds of readers/viewers by working with the press to provide accurate and timely information.

Media Inquiry management goals:

- Increase system awareness by positively positioning NamUs system as a useful tool and NIJ as the provider of the system
- Build positive relationships with trade and general media outlets

To measure the effectiveness of outreach efforts, the NamUs team regularly monitors website traffic.

Media Plan Objective: To broaden national awareness of the NamUs system, drive traffic to the website, and measure the effectiveness of the media campaign.

Target Audiences:

1. Practitioners: including law enforcement, state clearinghouses, medical examiners and coroners, and victim advocacy groups
2. Policymakers
3. General public (particularly with regard to missing persons)

Key Messages:

1. The NamUs system is live and operational
2. Information can be law enforcement and/or medical examiner and coroner sensitive.
3. The more cases entered into the system, the more people will be found or identified
4. NamUs provides automatic cross-matching capability
5. The general public can add case information to the MP database and search the databases

(To view the Media Plan Outline, see Appendix B.)

3.3 Outreach

The NamUs System is promoted to appropriate industry communities via workshops, conference exhibits, presentations and trade publications. Exhibits and presentations are used to drive the program, facilitating in-person introductions to the system.

In addition, regular email communication vehicles (e.g., e-newsletters, email blasts, conference calls) may be developed to bring regular system updates about NamUs to state clearinghouses.

3.3.1 NamUs National Training Strategy

To ensure the user community understands how to effectively use NamUs, the NamUs team provides online training for law enforcement users via a Web-based portal accessible at <http://projects.nfstc.org/namus>. In addition, the NamUs team will provide information sessions and training at a variety of missing and unidentified person events and regional and national conferences, and deliver periodic webinars to support NamUs stakeholders.

4 User Community

The user community is the total group of stakeholders who will interact with the NamUs program, primarily through the use of NamUs Web tools such as the NamUs MP and UP databases. This group is comprised of four primary types of users:

- Law enforcement
- Medical examiners and coroners
- Missing persons clearinghouses
- Public citizens

The user community is the prime customer and all programmatic support is geared to addressing their needs pertaining to unidentified persons and missing persons.

4.1 Medical Examiners and Coroners

Medical examiners and coroners will primarily use the NamUs UP database to provide information about their agency's unidentified cases. They will interact with the RSS and Forensic Service teams, as coordinated by the NFSTC, to access resources that the individual agency may require to enrich the information provided for their cases.

Medical examiners and coroners registered in the NamUs UP database system maintain control over their cases, and can select the level of detail they deem appropriate for each case. Unlike the NamUs MP database, the public does not input UP cases or transfer ownership of these cases.

4.2 Missing Persons Clearinghouse

State Missing Persons Clearinghouses support local agencies and act as a resource for missing persons investigators. These clearinghouses will primarily use the MP database to collect, enter and manage missing persons reports. These agencies provide key functions for processing missing persons reports, particularly those collected from the public. Clearinghouses perform several key tasks during the processing of reports:

- Act as State point of contact
- Validate cases
- Publish cases to the system
- Support requests for NCIC or other agency data exchanges

4.3 Public

Public citizens will generally interact with the NamUs.gov portal and the supporting databases for unidentified and missing persons. The public may search and review information made available on NamUs UP by medical examiners and coroners. The system allows them to perform their own research to locate a missing person, and they may submit cases to the MP database using information they possess or have collected while working with missing persons investigators and coordinators. Additionally, the public may search through missing persons cases that have been validated and published.

Registered public users may enter missing persons cases for family members; however, these cases will be validated by an RSS or case manager through law enforcement or NCIC before these cases are published to NamUs.

4.4 Law Enforcement

Upon validation, law enforcement officers will be issued a secure login that provides access to secure case information. Law enforcement access allows the user to view dental records, fingerprints, DNA availability, and case notes. This information will not be made available to the public.

Law enforcement officers will primarily use the NamUs MP database to enter and manage cases that they or their jurisdiction is handling. Law enforcement officers will work directly with the NamUs RSSs to manage and validate cases, and access no-cost services provided by the Forensic Services team.

5 NamUs UP and MP Database Overview

NamUs contains missing persons and unidentified decedent data that is stored in two separate databases. The databases contain a similar structure and common data elements to allow for convenient cross-matching capabilities and case viewing. Each NamUs database has unique features that support specific needs of the user communities and stakeholders.

5.1 NamUs UP Database

The NamUs UP database is a searchable database created to assist in solving unidentified remains cases. The system includes cases from throughout the United States and is searchable using demographics, physical characteristics, case numbers or other specific information. NamUs unidentified persons cases are automatically cross-matched with missing persons cases stored in the system.

Medical examiners and coroners primarily use the NamUs UP system to provide information about their agency's unidentified cases. They will interact with the NamUs RSSs and Forensic Service team. The NamUs UP allows for public searches and includes a secure login for registered public users that provides case-tracking features.

5.1.1 NamUs UP Data Elements

The NamUs UP database uses common elements to allow cross-matching with the MP database. The data elements contain detailed information about the case and related circumstances. The UP data elements are grouped into the following main categories:

- Case Information
- Demographics
- Circumstances
- Physical/Medical
- Fingerprints
- Clothing and Accessories
- Dental
- DNA
- Images
- Documents

- Police Information

(A detailed list of NamUs UP data elements is available in Appendix C.)

5.1.2 NamUs UP User Access Levels

UP user permission levels are similar to MP, and include a registered public user level. The specific user levels are listed below.

- **General Public (Not Registered)**

Non-registered public users can search the system and view cases. They have access to limited data and some images.

- **Public Users (Registered)**

Registered public users have the same abilities as the general public except they can also track case changes.

- *Note: Registered Public users on NamUs UP can NOT add or edit cases. They also have access to only select case data.*

- **Law Enforcement Officers**

Law enforcement (LE) users can view all data, images and messages for each case in the system.

- *Note: When a law enforcement) user registers with the UP database, an email is automatically sent to the sponsor listed in the registration file. Until the sponsor responds to the email inquiry, the LE user remains inactive.*

- **Medicolegal Officers (Medical Examiner, Coroner, Medicolegal Death Investigator)**

Medicolegal officers have all the privileges of law enforcement officers, as well as the ability to create cases.

- **Forensic Specialists (Forensic Odontologist, Forensic Anthropologist)**

A forensic specialist can edit specific data on all cases within his or her region. For example, a forensic odontologist registered in Michigan can edit dental information on all cases in Michigan.

- **Administrators (RSS, Case Manager)**

Administrators manage cases and users.

5.2 NamUs MP Database

The MP database is a searchable database created to assist in solving missing person cases. NamUs MP cases are automatically cross-matched against records in the NamUs UP database to identify possible matches. NamUs MP cases can be entered by registered public users but must be validated by RSSs with the appropriate law enforcement agency.

Law enforcement agencies use the NamUs MP database to provide information about their agency's missing person cases. They will interact with NamUs RSSs for case validation and with the Forensic Service team for case enhancement.

5.2.1 NamUs MP Data Elements

The NamUs MP and UP databases use common elements that allow cross-matching of MP cases to UP cases. The MP database contains additional data elements than the UP database. The MP data elements are grouped into the following categories:

- Case Information
- Circumstances
- Physical Characteristics
- Clothing and Accessories
- Electronic Communications
- Transportation Methods
- Dental
- Police Contacts
- DNA
- Media
- Features

(A detailed list of NamUs UP data elements is available in Appendix D.)

5.2.2 NamUs MP User Access Levels

User levels stipulate the data that can be accessed for viewing, entry and editing. MP user permission levels are described below.

- **General Public (Non-Registered)**
Non-registered public users can search the system and view cases, but have limited access to data and images.
- **Public Users (Registered)**
Registered public users can enter cases, edit cases they have entered, create a list of cases to track, and leave messages on cases in the activities log.
- **Law Enforcement Officers**
Law enforcement officers can view all data, images, and messages for each case in the system.
 - *Note: \ LE users registered on the MP side are verified by a NamUs RSS.*
- **Forensic Specialists (Forensic Odontologist, Forensic Anthropologist)**
A forensic specialist has the ability to edit specific data on all cases in his or her region. For example, a forensic odontologist registered in Michigan can edit dental information on all cases in Michigan.
- **Administrators (Case Manager)**
Administrators enter, upgrade, update and upload cases, and assist case owners in managing and updating cases.
- **Regional Services Specialists (RSS)**

RSSs manage cases and users, and provide permission for user activation and case publishing.

5.3 System Specifications

5.3.1 Security Overview

As an overview to the network setup for the NamUs Web application, a step-by-step trace of a user connection is useful. When a user initiates a connection to the NamUs website, the first line of security is that the user's request is inspected by a Cisco[®] firewall. If the request passes the firewall tests, it is then allowed to connect to the NamUs Web application located on the Web server.

Incoming connections to the Web server must use either Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS) or they are rejected by the firewall rules. To ensure security and data integrity, NamUs uses the Secure Sockets Layer (SSL) protocol. SSL encrypts the segments of network connections to provide end-to-end secure data relay.

Once a connection is established, the Apache Web server checks to make sure the user is connected using HTTPS. If the connection is not HTTPS, the Web server forwards the user's end device to an HTTPS connection to ensure secure data traffic.

The NamUs Web application then checks the user's authentication details and allows the user to pull data from the website based on his or her permissions set within the NamUs application. Each piece of data requested by the user is retrieved from the database server and handed to the client device only after access is verified by the NamUs Web application. Only the back-end of the Web application, connecting from the Web server, can access the data on the stand-alone database server. This specific access lock is to prevent malicious attacks directly at the database server.

Once the requested data is returned to the Web application from the database server, the NamUs application renders and returns the data through secured Web traffic. This traffic is then displayed for use by the client device's Web browser.

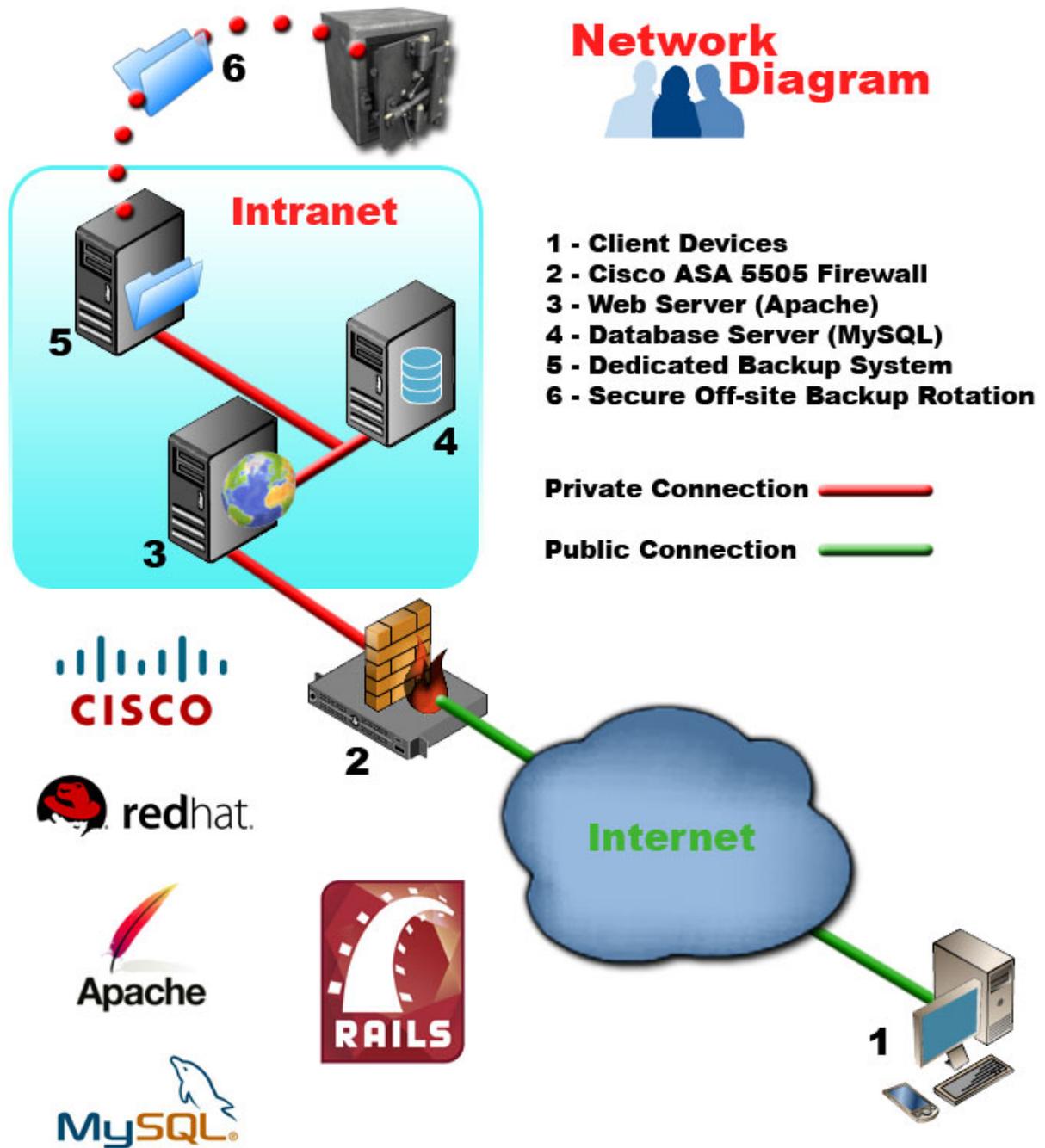


Figure 4. NamUs network diagram

5.3.2 Network Description

- **Public Connection** – The NamUs connection area is the public zone or Internet. This public connection area is the World Wide Web; people engaged in this system can access their case data anywhere they have access to the Internet. By using security-minded

programming policies, security hardware and HTTPS connections, it is possible for people to securely share information.

- **Private Connection** – Private connections are connections within the NamUs intranet. An intranet is a private network that is contained within an enterprise. The servers are within the same intranet to increase communication speed between the systems and make it possible to completely sever requests to the NamUs database server from any outside source. The intranet connection between the servers and the dedicated backup server ensures that data backup is completely secure. This is possible because the backup data does not have to pass through a public connection (i.e., the Internet).
- **Client Devices** – “Client devices” describes any device that is used to access and view data from the NamUs Web application. These devices can range from a PDA to a desktop PC. Client devices that connect to NamUs are required to be able to send and receive data and content using HTTPS secure with SSL. They also must be able to render and display HTML content. Client devices that meet these requirements will be able to fully use the system.
- **Cisco® ASA Firewall** – The Cisco firewall provides security without losing valuable system performance. This system operates by comparing NamUs access policies about an end-client’s network access rights to the data request surrounding each access attempt. If the variables do not match, the firewall blocks the access connection. If the variables match, the firewall allows the traffic to flow through the network. Since this device is a hardware firewall, it is resilient to all types of flooding attacks as the device is only concerned with packet and data inspection.

The hardware firewall filters requests from the Internet to the NamUs Web server. Only Web connections on port 80(HTTP) or 443(HTTPS) are allowed to pass to the Web server. Connections originating from the Internet cannot access the database server used to house valuable NamUs data. Only the NamUs Web application can request data from the database, which is then forwarded to the client device through the NamUs application. NamUs administrators have access to the admin tools on the Web and database servers through a limited set of verified IP addresses. This is yet another step in creating an extremely efficient and secure environment.

- **Web Server** – Apache is used to serve the NamUs website to client devices. FastCGI (Common Gateway Interface) is used through an Apache module to execute and view code for the Ruby-on-Rails–based NamUs application. . CGI programs are external programs that are called when a user requests a certain page. The CGI program receives information from the Web server (e.g., form variable values, type of browser, IP address of the client, etc.) and uses that information to output a Web page to the client. FastCGI is an external CGI processor that runs application requests isolated from the Web server. This isolation provides greater security and also allows requests to be distributed to multiple FastCGI processors, increasing speed. The security increase is provided because each request is isolated from the others. One request cannot attempt to access data being processed in the other (such as a user request accessing data from an administrator

request). Apache is a standard and popular Web server that is very powerful and versatile because of its extensibility through modules. NamUs uses SSL through Apache to secure data between the Web application and the client devices.

Ruby on Rails is the framework used to develop NamUs. Ruby on Rails runs through Apache using FastCGI and allows Web application coding that is both secure and easily maintainable. Ruby on Rails provides programmers the opportunity to automatically have input content escaping and authentication both for form data and for user sessions. Since much of the functionality is build into the framework, it is very easy to quickly add new features that are solidly secured. Because the Ruby on Rails language itself is object-oriented and promotes best coding practices, all of the views stay maintainable for future changes and updates.

- **Database Server** – NamUs uses a dedicated database server to ensure the security of data by separating the Web application from the raw data. This separation also decreases the time required to process database requests because the entire system's power is used for fetching data instead of fetching, rendering and returning data to the client devices.

The NamUs Web application uses MySQL database technology to store its data. Since the overlaying Web application code is written using the Ruby on Rails Web framework, it is possible to access databases of different architectures (e.g., PostgreSQL) in the future if needed. All database transactions are formatted using object role modeling (ORM). ORM is a conceptual design methodology that allows the user to express information not only as raw database-specific commands, but also as an object that has defined how it relates to other information objects. This ORM is why many types of databases can be accessed without changing the underlying back-end code.

MySQL was selected because of its scalability and performance. Scalability refers to MySQL's capacity to handle deeply embedded applications with a footprint of only 1MB when running massive data warehouses holding terabytes of information. MySQL's exceptional performance is due to an architecture that allows database professionals to configure the database server specifically for particular applications.

5.4 System Administration

5.4.1 General Server Information

All servers used in the production environment run on Red Hat[®] Enterprise Linux. These servers are regularly updated; hot fixes and general application and security updates are implemented daily. Updates are tested on a server mirror to ensure updates do not interfere with day-to-day operations. Physical access to the server is controlled at a data center. Data center access is controlled by card reader and biometric scanners. The centers also deploy proximity readers that track movement between areas, security cameras, and all windowed areas are behind bullet-proofing. The facilities are powered by dual-utility feeds from separate electrical service stations and are backed up by on-site generators.

Incremental backups are run nightly on the NamUs Web and database servers. These backups are stored on the managed backup system. This is another stand-alone piece of hardware that is used to off-load data backups from the NamUs system servers. This separation greatly improves system speeds and reduces the time it takes to make and retrieve backup data. Copies of the backups are securely moved and stored in three off-site locations to prevent data loss in the event of a natural disaster or destruction of the data center. Weekly full-system backups are also run during the weekend on non-peak hours. These full backups are handled in the same manner as the daily incremental backups.

5.5 NamUs Hosting Specifications

5.5.1 DELL® Poweredge R300 Specifications

Processor: Intel® Xeon X3363, 2.8Ghz, Quad-Core

FSB: 1333 Mhz

Chipset: Intel 5100

Memory: 8GB @ 667Mhz (MySQL Servers are at 24GB)

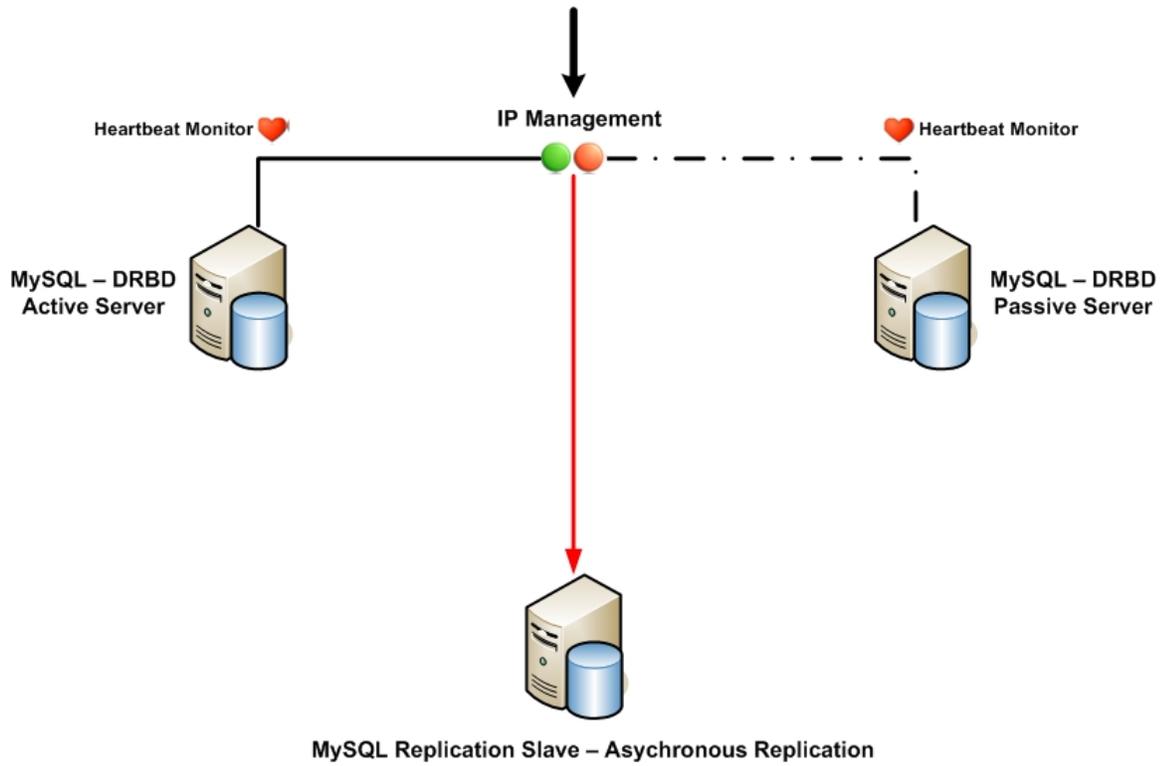
Hard Drives: 250GB 7.2Krpm SATA @ RAID1 (MySQL Servers are 1.0TB)

5.5.2 Level 3 WAN Specifications

- Level 3 SLA of 99.999% for network availability and 100% for power availability
- 20 Mb Synchronous Ethernet TDM that can be upgraded to an OC-48 fiber connection

5.5.3 NamUs Network Specifications

- Onsite, redundant DNS servers
- Constant network threat analyzer and offsite resource availability monitoring
- Full gigabit connectivity throughout internal network structure
- Dedicated Cisco switching for Web and MySQL network segments
- Enterprise-level SSL/TLS/HTTP load balancing with server affinity and dynamic resource management
- Virtual Private Networking for secure AES encryption tunneling of all development access to network systems
- Centralized authentication and file management for development team and authorized personnel

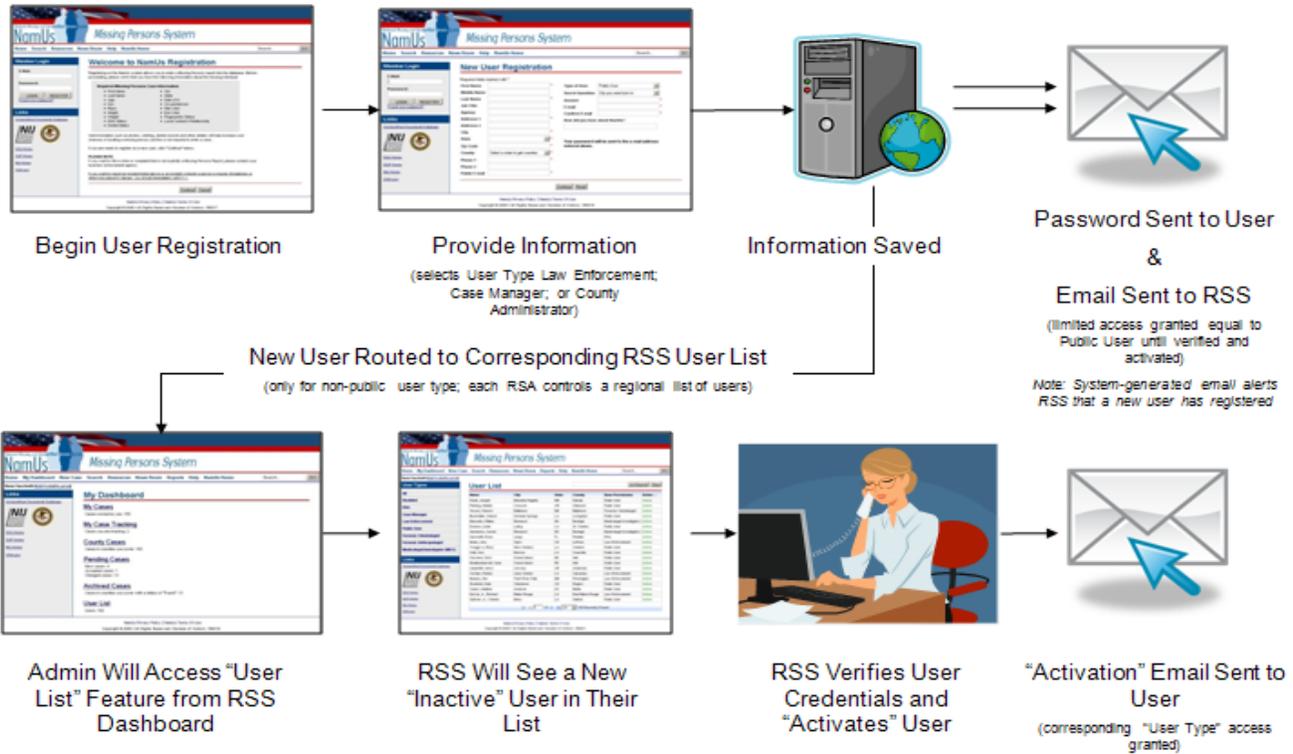


Appendices

- A. Registration and Verification Process**
- B. Media Plan Outline**
- C. UP Data Elements**
- D. MP Data Elements**

A. Registration and Verification Process

NamUs – National Missing Persons Data System, User Registration and Verification Process for Law Enforcement, Case Manager, and County Administrator Users (i.e. NON-PUBLIC Users)



B. NamUs Media Plan Outline

(Updated 1/11/2011)

Objective: To broaden national awareness of the NamUs system (www.namus.gov), drive traffic to the site, and measure the effectiveness of the media campaign

Target Audiences:

1. Practitioners: including law enforcement, medical examiners and coroners, state clearinghouses, State Attorney's Offices, victim advocacy groups
2. Policymakers
3. General Public: particularly with regard to missing persons

Key Messages:

1. NamUs system is live and working
2. More cases in the system equates to more people found or identified
3. Automatic cross-searching capability
4. General public can add case information and search the databases
- 5.

Measurement Metrics:

- Media 'hits' – number of articles, stories, etc. in outlets targeted to our key audiences
- Number of cases in the system – as awareness increases among target audiences, number of cases should increase
- Number of registered users in the system (by type)
- Increased Web traffic

Tactics and Tools:

- Communicate with various trade outlets to reach practitioners including law enforcement, state clearinghouses, victim advocacy groups, medical examiners and coroners

Story angles will vary, depending on audience and case details that can be publicized

- **NamUs Online News Room**

Maintain online resources containing media resources, fact sheets, FAQs, B-roll for television reporters, NamUs video, brochures, success stories, public service announcements and links to significant published NamUs news stories. (These materials have been placed in a newly created 'Newsroom' on www.findthemissing.com. The NFSTC NamUs team will develop and maintain this resource.)

- **Conferences** (NIJ and/or NFSTC attendance, presentations, exhibits and workshops)
 - AAFS Annual Meeting
 - Applied Technologies
 - NIJ Conference
 - National Sheriff's Association
 - Homicide Investigation Conference
 - Texas Sheriff's Association
 - IACME Conference
 - IAI International Educational Conference
 - NAME Conference
 - Regional AFS Conferences
 - IACP Annual Conference

- In addition, smaller conferences and workshops will be targeted and/or planned.

.Media Inquiry Protocol:

Media inquiries generally come through the OJP office of communications, but occasionally to NFSTC directly or through RSS. The protocol is to send all media leads to OJP office of communications representative, currently Sheila Jerusalem. NFSTC provides support to reporters and outlets, including interview selection and set up, spokesperson management and training, fact checking and other details as requested by the NIJ and OJP office of communications.

NFSTC also tracks NamUs media coverage through Vocus, an online news management system, and reports stories through the weekly traffic report and project progress reports.

C. Unidentified Persons - Data Elements

NamUs UP	Users View						
<p>Key for Users View: X = viewable to user Please note: Gray shading = not applicable</p>	Access Level			User Type			
	Full View & Full Edit			Medical Examiner, Coroner, or Case Manager (ME/C or CM)			
	Full View & Limited Edit			Medicolegal Death Investigator (M/D/I)			
	Full View & Limited Edit (Dental)			Forensic Odontologist (FO)			
	Full View & Limited Edit (Anthro)			Forensic Anthropologist (FA)			
	Full View Only			Law Enforcement (LE)			
	Limited View Only			Public (P)			
Limited View Only			General Public (G)				
Case Information	ME/C or CM	M/D/I	FO	FA	LE	P	G
Status (Identified/ unidentified - dropdown menu)	X	X	X	X	X	X	X
NamUs Case Number	X	X	X	X	X	X	X
NCIC Number	X	X	X	X	X		
Date Found	X	X	X	X	X	X	X
Date Created	X	X	X	X	X	X	X
Date Modified	X	X	X	X	X	X	X
Date QA Reviewed	X	X	X	X	X	X	X
Disposition of Body							
Cooler number	X	X	X	X	X		
Cemetary name	X	X	X	X	X		
Plot number	X	X	X	X	X		
Date/time buried	X	X	X	X	X		
Notes	X	X	X	X	X		
Demographics							
Estimated age	X	X	X	X	X	X	X
Minimum age	X	X	X	X	X	X	X
Maximum age	X	X	X	X	X	X	X
Race	X	X	X	X	X	X	X
Ethnicity	X	X	X	X	X	X	X
Sex	X	X	X	X	X	X	X
Height (inches)	X	X	X	X	X	X	X
Weight (pounds)	X	X	X	X	X	X	X
Probable year of death	X	X	X	X	X	X	X
Est. postmortem interval	X	X	X	X	X	X	X
Body Parts Inventory	X	X	X	X	X	X	X
Body condition	X	X	X	X	X	X	X

C. Unidentified Persons - Data Elements

NamUs UP	Users View						
Circumstances							
GPS Coordinate	X	X	X	X	X	X	X
Address 1	X	X	X	X	X	X	X
Address 2	X	X	X	X	X	X	X
City	X	X	X	X	X	X	X
State	X	X	X	X	X	X	X
Zip	X	X	X	X	X	X	X
County	X	X	X	X	X	X	X
Circumstances of death	X	X	X	X	X		
Cause of death	X	X	X	X	X		
Manner of death	X	X	X	X	X		
Physical/ Medical							
Hair Color	X	X	X	X	X	X	X
Left Eye Color	X	X	X	X	X	X	X
Right Eye Color	X	X	X	X	X	X	X
Eye description	X	X	X	X	X	X	X
No distinctive body features (radio button 1)	X	X	X	X	X	X	X
Distinctive features as described below (radio button 2)	X	X	X	X	X	X	X
<i>Amputations</i>	X	X	X	X	X	X	X
<i>Deformities</i>	X	X	X	X	X	X	X
<i>Scars and Marks</i>	X	X	X	X	X	X	X
<i>Tattoos</i>	X	X	X	X	X	X	X
<i>Piercings</i>	X	X	X	X	X	X	X
Artificial body parts and aids	X	X	X	X	X	X	X
Finger/Toe Nails	X	X	X	X	X	X	X
Medical Implants	X	X	X	X	X	X	X
Foreign Objects	X	X	X	X	X	X	X
Skeletal Findings (ex. Broken bones, etc).	X	X	X	X	X	X	X
Organ Absent	X	X	X	X	X	X	X
Prior Surgery	X	X	X	X	X	X	X
Fingerprints							
Fingerprint information is currently not available	X	X	X	X	X	X	X
Fingerprint information is available elsewhere	X	X	X	X	X	X	X
Fingerprint information below	X	X	X	X	X	X	X

C. Unidentified Persons - Data Elements

NamUs UP	Users View						
(enter Classifications)	X	X	X	X	X		
Clothing and Accessories							
Clothing and accessories are unknown	X	X	X	X	X	X	X
Clothing and accessories are described below	X	X	X	X	X	X	X
<i>Clothing on body (free text box to describe)</i>	X	X	X	X	X	X	X
<i>Clothing with body (free text box to describe)</i>	X	X	X	X	X	X	X
<i>Footwear (free text box to describe)</i>	X	X	X	X	X	X	X
<i>Jewelry (free text box to describe)</i>	X	X	X	X	X	X	X
<i>Eyewear (free text box to describe)</i>	X	X	X	X	X	X	X
Dental							
Dental information / charting is currently not available	X	X	X	X	X	X	X
Dental information / charting is available and will be entered later	X	X	X	X	X	X	X
Dental information below	X	X	X	X	X	X	X
(NCIC Chart)	X	X	X	X	X		
(xray available box checked)	X	X	X	X	X		
Dental comments	X	X	X	X	X	X	X
Dental Models and/or Photographs of Teeth Available	X	X	X	X	X		
Dentist Information	X	X	X	X	X		
DNA							
Sample is currently not available	X	X	X	X	X	X	X
Initial Inquiry Underway	X	X	X	X	X	X	X
Sample available - not yet submitted	X	X	X	X	X	X	X
Samples submitted - tests not complete	X	X	X	X	X	X	X
Complete - Insufficient DNA for profiling	X	X	X	X	X	X	X
Complete and entered	X	X	X	X	X	X	X
(entered information such as Ref # and supporting fields)	X	X	X	X	X		
DNA Location	X	X	X	X	X		
Images							
Images (categorized with drop down menu)	<i>If categorized properly, user G and/ or P will not see sensitive images.</i>						
Police Information							
Title	X	X	X	X	X		
First Name	X	X	X	X	X		
Last Name	X	X	X	X	X		

C. Unidentified Persons - Data Elements

NamUs UP	Users View						
Jurisdiction	X	X	X	X	X		
ORI	X	X	X	X	X		
Agency	X	X	X	X	X		
City	X	X	X	X	X		
State	X	X	X	X	X		
Zip Code	X	X	X	X	X		
Phone	X	X	X	X	X		
Email	X	X	X	X	X		
Case Number	X	X	X	X	X		
Date Reported	X	X	X	X	X		
Circumstances	X	X	X	X	X		
Exclusions							
NamUs UP #	X	X	X	X	X		
Last Name	X	X	X	X	X		
First Name	X	X	X	X	X		
Reason	X	X	X	X	X		
Description	X	X	X	X	X		
Reports							
Case Report	X	X	X	X	X	X	X
Case Chronology Report	X	X	X	X	X		
Activities Log Data	X	X	X	X	X		
Contacts							
<i>Local Contact (ME/ C)</i>	X	X	X	X	X	X	X
Agency	X	X	X	X	X	X	X
Phone	X	X	X	X	X	X	X
<i>Case Manager</i>	X	X	X	X	X	X	X
First Name	X	X	X	X	X	X	X
Last Name	X	X	X	X	X	X	X
Email	X	X	X	X	X	X	X
<i>RSA</i>	X	X	X	X	X	X	X
Name	X	X	X	X	X	X	X
Email	X	X	X	X	X	X	X

D. Missing Persons - Data Elements

NamUs MP	Users View						
<p>Key for Users View: X = viewable to user P* = view of public user (registered) outside of their 'owned' cases Please note: Gray shading = not applicable</p>	Access Level					User Type	
	Full View, Full Edit, & CM Activation					RSA	
	Full View & Full Edit					Case Manager (CM)	
	Full View & Limited Edit					Law Enforcement (LE)	
	Full View & Limited Edit (Dental)					Forensic Odontologist (FO)	
	Full View & Limited Edit (Anthrop)					Forensic Anthropologist (FA)	
	Limited View & Limited Edit					Public User (P)	
	Limited View					General Public (G)	
Case Information	RSA	CM	LE	FO	FA	P*	G
Status	X	X	X	X	X	X	X
First Name	X	X	X	X	X	X	X
Middle Name	X	X	X	X	X	X	X
Last Name	X	X	X	X	X	X	X
Maiden Name	X	X	X	X	X		
Nickname (s)	X	X	X	X	X	X	X
Date of Birth	X	X	X	X	X		
Place of Birth	X	X	X	X	X		
NCIC Number	X	X	X	X	X		
NCMEC Number	X	X	X	X	X	X	X
Date LKA	X	X	X	X	X	X	X
Age	X	X	X	X	X	X	X
Race	X	X	X	X	X	X	X
Ethnicity	X	X	X	X	X	X	X
Sex	X	X	X	X	X	X	X
Height	X	X	X	X	X	X	X
Weight	X	X	X	X	X	X	X
Blood Type	X	X	X	X	X		
Circumstances							
Type of Address	X	X	X	X	X		
Address	X	X	X	X	X		
Cross Street	X	X	X	X	X		
Other	X	X	X	X	X		

Address 1 LKA	X	X	X	X	X		
Address 2 LKA	X	X	X	X	X		
City	X	X	X	X	X	X	X
State	X	X	X	X	X	X	X
Zip	X	X	X	X	X	X	X
County	X	X	X	X	X	X	X
Foul Play Indicated	X	X	X	X	X		
Circumstances	X	X	X	X	X	X	X
Financial Transactions	X	X	X	X	X		
Physical/ Medical							
Hair Color	X	X	X	X	X	X	X
Left Eye Color	X	X	X	X	X	X	X
Right Eye Color	X	X	X	X	X	X	X
No distinctive body features (radio button 1)	X	X	X	X	X	X	X
Distinctive features as described below (radio button 2)	X	X	X	X	X	X	X
<i>Amputations</i>	X	X	X	X	X	X	X
<i>Deformities</i>	X	X	X	X	X	X	X
<i>Scars and Marks</i>	X	X	X	X	X	X	X
<i>Tattoos</i>	X	X	X	X	X	X	X
<i>Piercings</i>	X	X	X	X	X	X	X
<i>Artificial Body Parts and Aids</i>	X	X	X	X	X	X	X
<i>Finger/Toe Nails</i>	X	X	X	X	X	X	X
Medical Implants	X	X	X	X	X	X	X
Foreign Objects	X	X	X	X	X	X	X
Skeletal Information	X	X	X	X	X	X	X
Organ Absent	X	X	X	X	X		
Prior Surgery	X	X	X	X	X		
Medications	X	X	X	X	X		
Drugs of Abuse	X	X	X	X	X		
Known Allergies	X	X	X	X	X		
Known Illnesses	X	X	X	X	X		
Medical Conditions and Disorders	X	X	X	X	X		
Clothing and Accessories							
Clothing and accessories are unknown (radio button 1)	X	X	X	X	X	X	X
Clothing and accessories are described below (radio button 2)	X	X	X	X	X	X	X
Clothing (free text box to describe)	X	X	X	X	X	X	X
Footwear (free text box to describe)	X	X	X	X	X	X	X
Jewelry (free text box to describe)	X	X	X	X	X	X	X
Eyewear (free text box to describe)	X	X	X	X	X	X	X
Accessories (free text box to describe)	X	X	X	X	X	X	X

Electronic Communications							
Cellphone	X	X	X	X	X		
Pager	X	X	X	X	X		
Internet access history	X	X	X	X	X		
Transportation Methods							
Vehicle Make	X	X	X	X	X	X	X
Vehicle Model	X	X	X	X	X	X	X
Year	X	X	X	X	X	X	X
Style	X	X	X	X	X	X	X
Vehicle Color	X	X	X	X	X	X	X
VIN	X	X	X	X	X		
Tag Type	X	X	X	X	X	X	X
Tag Number	X	X	X	X	X	X	X
Tag State	X	X	X	X	X	X	X
Expiration Year	X	X	X	X	X	X	X
Vehicle Comments	X	X	X	X	X	X	X
Airline	X	X	X	X	X	X	X
Bus	X	X	X	X	X	X	X
Secondary Parties							
Entered by relationship status first	X	X	X	X	X		
Dental							
Dental information / charting is currently not available	X	X	X	X	X	X	X
Dental information / charting is available and will be entered later	X	X	X	X	X	X	X
Dental information below (NCIC Chart)	X	X	X	X	X		
(xray available box checked)	X	X	X	X	X		
Dental comments	X	X	X	X	X		
Dental Models and/or Photographs of Teeth Available	X	X	X	X	X		
Dentist Information	X	X	X	X	X		
DNA							
Sample is currently not available	X	X	X	X	X	X	X
Initial Inquiry Underway	X	X	X	X	X	X	X
Sample available - not yet submitted	X	X	X	X	X	X	X
Samples submitted - tests not complete	X	X	X	X	X	X	X
Complete	X	X	X	X	X	X	X
Complete - entered (Reference # and support fields)	X	X	X	X	X		
DNA Location	X	X	X	X	X		
Fingerprints							
Fingerprint information is currently not available	X	X	X	X	X	X	X

Fingerprint information is available elsewhere	X	X	X	X	X	X	X
Fingerprint information below (enter Classifications)	X	X	X	X	X	X	X
Images							
Images (categorized, pending on category chosen will make users G and P avail to see)	X	X	X	X	X	X	X
Police Information							
Title	X	X	X	X	X	X	X
First Name	X	X	X	X	X	X	X
Last Name	X	X	X	X	X	X	X
Jurisdiction	X	X	X	X	X	X	X
ORI	X	X	X	X	X		
Agency	X	X	X	X	X	X	X
Address	X	X	X	X	X	X	X
City	X	X	X	X	X	X	X
State	X	X	X	X	X	X	X
Zip Code	X	X	X	X	X	X	X
Phone	X	X	X	X	X	X	X
Email	X	X	X	X	X	X	X
Case Number	X	X	X	X	X	X	X
Date Reported	X	X	X	X	X	X	X
Comments	X	X	X	X	X	X	X
Circumstances	X	X	X	X	X		
Exclusions							
NamUs UP #	X	X	X	X	X		
Last Name	X	X	X	X	X		
First Name	X	X	X	X	X		
Reason	X	X	X	X	X		
Description	X	X	X	X	X		
Reports							
Case Report	X	X	X	X	X	X	X
Case Chronology Report	X	X	X	X	X		
Activities Log Report	X	X	X	X	X		
Printable Poster	X	X	X	X	X	X	X
Email Poster	X	X	X	X	X	X	X
Activities Log Report	X	X	X	X	X		
Contacts							
Local Contact (case creator)	X	X	X	X	X		

First Name	X	X	X	X	X		
Last Name	X	X	X	X	X		
Email	X	X	X	X	X		
Relationship	X	X	X	X	X		
Describe	X	X	X	X	X		
Managed By	X	X	X	X	X	X	X
First Name	X	X	X	X	X	X	X
Last Name	X	X	X	X	X	X	X
Email	X	X	X	X	X	X	X
Phone	X	X	X	X	X	X	X
Regional System Administrator	X	X	X	X	X	X	X
First Name	X	X	X	X	X	X	X
Last Name	X	X	X	X	X	X	X
Email	X	X	X	X	X	X	X
Phone	X	X	X	X	X	X	X